UNIVERSITI TEKNOLOGI MARA

PERFORMANCE OF PADDY AS AFFECTED BY *Bacillus subtilis* AND NITROGEN RATES

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Final year project report submitted in partial fulfilment of the requirements for the degree of
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CANDIDATE'S DECLARATION

I declare that the work in this Final Year Project was carried out in accordance with the regulations of Universiti Teknologi Mara. It is original and is the result of my own work, unless otherwise indicated or acknowledged as referenced work. The final year project report has not been submitted to any other academic institution or non academic institution for any other degree or qualification.

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ABSTRACT

Nitrogen is the most important nutrient needed in paddy cultivation. Nitrogen fertilizer was a must in paddy cultivation to supply the nutrient. To promote better growth performance and yield, use of biofertilizer can give advantages and reduce pollution by synthetic fertilizer. *Bacillus subtilis* are biofertilizer that useful in improving paddy growth. *Bacillus subtilis* is aerobic or facultative anaerobic Gram positive rod shaped bacteria that having common physiological traits that can survive under harsh condition such as multilayered cell wall structure that uphold the shape and withstand the cell's high internal tugor pressure and formation of stress resistant endospore that actively form in stress condition for their survival. It also gives benefits to the plant trough their secretion of phytohormones, peptide antibiotics and extracellular enzyme. Phytohormones such as auxin, gibberellins and cytokinins that have been produce by *Bacillus subtilis* promote the growth of plant due to their ability to promote cell elongation, cell division, leaves development, seed germination, and maturity of fruit and delay ageing of leaves. Based on these abilities, *Bacillus subtilis* was used as plant growth promoting rhizobacteria (PGPR). They also used as biocontrol due to secretion of antibiotics and also promote induce systemic resistance of plant that help plant to fight with pathogen and can growth healthily. Factorial experiment was conducted in the greenhouse to study about effect of *Bacillus subtilis* and effect of different nitrogen rate on paddy. Experiment consists of eight treatments with four different nitrogen fertilizer rates and two levels of bacteria (with or without). The result shows that there is significant different in paddy growth performance and yield due to different rates of nitrogen where lowest rates (50% nitrogen fertilizer) shown lowest means of paddy growth performance and yield while highest rate (100% nitrogen fertilizer) shown highest means of paddy growth performance and yield. For the application of *Bacillus subtilis*, result shows that there is no significant different between two treatments that having same rate of nitrogen but different levels of bacteria. Nevertheless, means of each treatment that having presences of bacteria are slightly higher than means of treatments that not have bacteria. Treatment F100B1 (100% nitrogen fertilizer, with bacteria) showing highest means of growth performance and yield which was 35.5 units for total actual number of tiller, 131.5 units for total actual number of leaves, 33.5 units for total actual number of panicles and 124.6 g of grain yield. Treatment F100B0 (100% nitrogen bacteria, no bacteria) being second highest by having 34.5 units of total actual number of tiller, 128.8 units of total actual number of leaves, 31.3 units of total actual number of panicles and 110.4 g weight of grain yield.

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